

How Effective are Roadside Inspections and Traffic Enforcements?

The Roadside Inspection and Traffic Enforcement programs are two of the Federal Motor Carrier Safety Administration's (FMCSA) key safety programs. The Roadside Inspection program consists of roadside inspections performed by qualified safety inspectors following the guidelines of the North American Standard, which were developed by FMCSA and the Commercial Vehicle Safety Alliance. Most roadside inspections are conducted by the States under the Motor Carrier Safety Assistance Program (MCSAP). There are five levels of inspections that include a vehicle component, a driver component, or both. The Traffic Enforcement program is composed of two distinct activities: a traffic stop as a result of a moving violation and a roadside inspection.

FMCSA, in cooperation with the Volpe National Transportation Systems Center, has developed an analytic model to measure the effectiveness of roadside inspections and traffic enforcements in terms of crashes avoided, injuries avoided, and lives saved. This model provides FMCSA management with information to address the requirements of the Government Performance and Results Act of 1993 (GPRA), which obligates Federal agencies to measure the effectiveness of their programs as part of the budget cycle process. It also provides FMCSA and State safety program managers with a quantitative basis for optimizing the allocation of safety resources in the field. This analytic model is known as the Intervention Model.

The Intervention Model is based on the premise that the two programs—Roadside Inspection and Traffic Enforcement—directly and indirectly contribute to a reduction in crashes. The model includes two submodels that are used for measuring these different effects:

- Direct effects are based on the assumption that vehicle and/or driver defects discovered and then corrected as the result of interventions reduce the probability that these vehicles/drivers will be involved in subsequent crashes. The model calculates direct-effect-prevented crashes according to the number and type of violations detected and corrected during an intervention.
- Indirect effects are the by-products of the carriers' increased awareness of FMCSA programs and the potential consequences that the programs could impose if steps are not taken to ensure and/or maintain higher levels of safety. In order to measure indirect effects, which are essentially changes in behavior involving driver preparation, practices and vehicle maintenance, the model calculates responses to exposure to the programs and the resulting reduction in potentially crash-causing violations.

How Can FMCSA Use the Model?

By using motor carrier categories, or classes, such as those developed in the Analysis Division's Motor Carrier Industry Profile research, the Analysis Division can assist FMCSA managers in using the model to study program effectiveness among carrier classes. Differences in fleet size, SafeStat score, etc., may contribute to differences in direct-effect and indirect-effect program impacts. A better understanding of carrier classes and how they react to interventions will aid in the application and development of the Roadside Inspection and Traffic Enforcement programs.

Most recently, the model was implemented to measure program effectiveness during the 2004 activity year using March 25, 2005 data extracted from the Motor Carrier Management Information System (MCMIS). The number of inspections as well as the model results are shown below for 2004 and the previous two years.

Program Exposure 2002 - 2004

	2002	2003	2004
Roadside Inspections	2,255,921	2,215,762	2,211,875
Traffic Enforcements	762,561	791,157	803,032
<i>Total Interventions</i>	<i>3,018,482</i>	<i>3,006,919</i>	<i>3,014,907</i>

Program Effectiveness 2002 - 2004

	2002	2003	2004
Crashes Avoided			
Roadside Inspection	12,235	12,667	9,606
Traffic Enforcement	4,602	4,484	9,067
<i>Total</i>	<i>16,387</i>	<i>17,151</i>	<i>18,673</i>
Injuries Avoided			
Roadside Inspection	9,240	9,647	7,004
Traffic Enforcement	3,476	3,415	6,611
<i>Total</i>	<i>12,716</i>	<i>13,062</i>	<i>13,615</i>
Lives Saved			
Roadside Inspection	567	534	371
Traffic Enforcement	214	188	351
<i>Total</i>	<i>781</i>	<i>722</i>	<i>722</i>

In the years prior to 2004, a percentage of the Traffic Enforcement program benefits were credited to the Roadside Inspection program. This was done to account for the fact that a traffic enforcement is composed to two distinct activities. For 2004 onward, this reallocation has been removed and the Traffic Enforcement program benefits will be broken out between the traffic enforcement activity, roadside inspection activity, and a combined activity, which quantifies the benefits of performing both activities during the same intervention.

2004 Traffic Enforcement Activity Level Results

	Crashes Avoided	Injuries Avoided	Lives Saved
Traffic Enforcement Activity	3,371	2,458	130
Roadside Inspection Activity	3,152	2,298	122
Combined Activity	2,544	1,855	99
<i>Total</i>	<i>9,067</i>	<i>6,611</i>	<i>351</i>

For questions or comments please contact Mr. Dale Sienicki of FMCSA's Analysis Division at 202-366-1861 or via e-mail at dale.sienicki@fmcsa.dot.gov. A full discussion of the model results as well as a description of the model methodology can be obtained at: <http://ai.fmcsa.dot.gov/ProgramMeasures/PM/PM.asp>